What is claimed is:

1. An impeller assembly for a waste pulping apparatus comprising:

a rotating blade for pulping waste to form a slurry, the rotating blade having an axis of rotation, a base and a plurality of ears that axially extend away from the base;

a sieve ring having axially opposed first and second ends, an inner cylindrical surface and an outer cylindrical surface, wherein the sieve ring encircles the base at the first end and at least a portion of the ears are radially spaced inside the inner cylindrical surface so that the ears rotate within the sieve ring; and

a plurality of pumping vanes for pumping the slurry, wherein each pumping vane has a pumping surface that rotates radially outside of the outer cylindrical surface of the sieve ring.

2. An impeller assembly according to claim 1, further comprising a stationary blade adjacent to the sieve ring inner cylindrical surface and in close proximity to the ears of the rotating blade.

3. An impeller assembly according to claim 1, wherein each ear axially extends past the second end of the sieve ring to form a distal end opposite the base, wherein the ears further comprise winglets connected to the distal ends of the ears.

4. An impeller assembly according to claim 3, further comprising a stationary blade adjacent to the inner cylindrical surface at the second end of the sieve ring and axially extending from the second end of the sieve ring and in close proximity to the rotating blade, the stationary blade having a top surface opposite the second end of the sieve, wherein the winglet has a bottom surface that passes within a predetermined clearance from the top surface of the stationary blade.

5. An impeller assembly according to claim 1, wherein each pumping vane has a leading leg, a middle leg and a trailing leg, wherein a rear portion of the middle leg is directed to the outer cylindrical surface of the sieve ring so that there is a predetermined clearance between the rear portion of the middle leg and the outer cylindrical surface, and wherein a rear portion of the trailing leg is directed away from the outer cylindrical surface.

6. An impeller assembly according to claim 5, wherein each leg is generally planar.

7. An impeller assembly according to claim 5, wherein the pumping surface is provided on the trailing leg of the pumping vane.

8. An impeller assembly according to claim 1, wherein the sieve ring includes sizing holes, and wherein the sizing holes have a diameter of between about 1.3 cm and about 1.9 cm.

9. An impeller assembly according to claim 1, further comprising interrupter bars connected to the inner cylindrical surface of the sieve ring so that the interrupter bars project radially inward and are in close proximity with the ears of the rotating blade.

10. A waste pulping apparatus comprising:

a tank for containing liquid and solids to be pulped;

a slurry chamber adjacent to the tank, the slurry chamber having a volute;

a sieve ring mounted to the tank at the slurry chamber, the sieve ring having axially opposed first and second ends, an inner cylindrical surface, and an outer cylindrical surface, wherein the second end is mounted to the tank so that the first end and a portion of the cylindrical surfaces are within the slurry chamber;

a rotating blade for pulping waste to form a slurry, the rotating blade having an axis of rotation, a base , and a plurality of ears that axially extend away from the base;

wherein the first end of the sieve ring encircles the base of the rotating blade and at least a portion of the ears are radially spaced inside the inner cylindrical surface of the sieve ring so that the ears rotate within the sieve ring;

a stationary blade adjacent to the inner cylindrical surface at the second end of the sieve ring and axially extending from the second end of the sieve ring, wherein the stationary blade is in close proximity to the ears of the rotating blade; and

a plurality of pumping vanes for pumping the slurry out of the volute of the slurry chamber, wherein each pumping vane has a pumping surface that rotates radially outside of the outer cylindrical surface of the sieve ring.

11. A waste pulping apparatus according to claim 10, wherein the ears axially extend past the second end of the sieve ring to a distal end opposite the base of the rotating blade, further comprising winglets connected to the distal ends of the ears.

12. A waste pulping apparatus according to claim 11, wherein the stationary blades have a top surface opposite the second end of the sieve ring and wherein the winglet has a bottom surface that passes within a predetermined clearance from the top surface of the stationary blade.

13. A waste pulping apparatus according to claim 10, wherein each pumping vane has a leading leg, a middle leg and a trailing leg, wherein a rear portion of the middle leg is directed to the outer cylindrical surface of the sieve ring so that there is a predetermined clearance between the rear portion and the outer cylindrical surface, and wherein a rear portion of the trailing leg is directed away from the outer cylindrical surface surface.

14. A waste pulping apparatus according to claim 10, wherein the sieve ring includes sizing holes, and wherein the sizing holes have a diameter of between about 1.3 cm and about 1.9 cm.

15. A waste pulping apparatus according to claim 10, further comprising a flange integrally attached to the second end of the sieve ring, wherein the flange is mounted to the sieve ring.

16. A variable-head impeller assembly for a waste pulping apparatus for use in any of a plurality of expected downstream head conditions, comprising:

a sieve ring having axially opposed first and second ends, an inner cylindrical surface and an outer cylindrical surface;

a rotating blade for pulping waste, the rotating blade having an axis of rotation, a base and a plurality of ears that axially extend away from the base;

wherein the sieve ring encircles the base at the first end and at least a portion of the ears are radially spaced inside the inner cylindrical surface so that the ears rotate within the sieve ring;

a plurality of first pumping vanes providing a predetermined flow rate against a first predetermined head;

a plurality of second pumping vanes providing the predetermined flow rate against a second predetermined head;

wherein one of the pluralities of pumping vanes is selected in order to best match predetermined head with expected downstream head conditions to provide the predetermined flow rate; and

wherein each pumping vane in the selected one of the pluralities has a pumping surface that rotates radially outside of the outer cylindrical surface of the sieve ring.

17. A variable-head impeller assembly according to claim 16, wherein each pumping vane has a leading leg, a middle leg and a trailing leg, wherein a rear portion of the middle leg is directed to the outer cylindrical surface of the sieve ring so that there is a predetermined clearance between the rear portion and the outer cylindrical surface, and wherein a rear portion of the trailing leg is directed away from the outer cylindrical surface.

18. A variable-head impeller assembly according to claim 16, further comprising a stationary blade adjacent to the inner cylindrical surface at the second end of the sieve ring, wherein the stationary blade is in close proximity to the ears of the rotating blade.

19. A variable-head impeller assembly according to claim 16, wherein the selected one of the pluralities of pumping vanes provides a predetermined combined flow rate of about 90 to about 120 gallons per minute.

20. A method for assembling an impeller assembly for a waste pulping apparatus comprising:

providing a sieve ring having axially opposed first and second ends, an inner cylindrical surface and an outer cylindrical surface;

providing a rotating blade for pulping waste, the rotating blade having an axis of rotation, a base, and a plurality of ears that axially extend away from the base;

wherein the first end of the sieve ring encircles the base of the rotating blade and at least a portion of the ears are radially spaced inside the inner cylindrical surface of the sieve ring so that the ears rotate within the sieve ring;

selecting a plurality of matching pumping vanes having a pumping surface providing a predetermined flow rate against a predetermined head; and

connecting each one of the plurality of pumping vanes to the means for rotating the rotating blade so that each pumping surface rotates radially outside of the outer cylindrical surface of the sieve ring.

21. A method in accordance with claim 20, wherein the plurality of matching pumping vanes provides a predetermined combined flow rate of about 90 to about 120 gallons per minute.

22. A method for assembling a waste pulping apparatus comprising:

providing a tank for containing liquid and solids to be pulped;

mounting a sieve ring to the tank, the sieve ring having axially opposed first and second ends, an inner cylindrical surface, and an outer cylindrical surface, wherein the sieve ring is mounted to the tank at the second end;

providing a rotating blade for pulping waste, the rotating blade having an axis of rotation, a base, and a plurality of ears that axially extend away from the base;

wherein the first end of the sieve ring encircles the base of the rotating blade and at least a portion of the ears are radially spaced inside the inner cylindrical surface of the sieve ring so that the ears rotate within the sieve ring;

providing a means for rotating the rotating blade;

providing a stationary blade adjacent to the inner cylindrical surface at the second end of the sieve ring, wherein the stationary blade is in close proximity to the ears of the rotating blade;

selecting a plurality of matching pumping vanes, each having a pumping surface designed to provide a predetermined flow rate; and

connecting each one of the plurality of pumping vanes to the means for rotating the rotating blade so that its pumping surface is radially outside of the outer cylindrical surface of the sieve ring.

23. A method in accordance with claim 22, wherein the plurality of matching pumping vanes provides a predetermined combined flow rate of about 90 to about 120 gallons per minute.

24. A method in accordance with claim 22, wherein the tank has a fill volume, and wherein the plurality of matching pumping vanes provides a predetermined combined flow rate of about 5 to about 6 tank fill volumes per minute.

25. A method in accordance with claim 22, wherein the sieve ring includes a flange integrally attached to the second end of the sieve ring so that the flange is mounted to the tank.

26. An impeller assembly for a waste pulping apparatus comprising:

a sieve ring having axially opposed first and second ends, an inner cylindrical surface and an outer cylindrical surface;

a rotating blade for pulping waste, the rotating blade having an axis of rotation, a base and a plurality of ears that axially extend away from the base;

wherein the sieve ring encircles the base at the first end and at least a portion of the ears are radially spaced inside the inner cylindrical surface so that the ears rotate within the sieve ring;

means for rotating the rotating blade;

a plurality of pumping vanes for pumping the slurry, each pumping vane having a leading leg connected to the means for rotating the rotating blade and a trailing leg connected to the leading leg;

wherein the leading leg is connected to the means for rotating the rotating blade so that the leading and trailing legs are radially outside of the outer cylindrical surface of the sieve ring;

wherein a rear portion of the leading leg is directed toward the outer cylindrical surface of the sieve ring so that there is a predetermined clearance between the rear portion of the middle leg and the outer cylindrical surface; and

wherein a rear portion of the trailing leg is angled away from the outer cylindrical surface of the sieve ring.

27. An impeller assembly according to claim 26, wherein the rear portion of the leading leg and the trailing leg are generally planar.

28. An impeller assembly according to claim 26, wherein a second portion of the leading leg is generally parallel to a plane that is tangent to the outside surface of the sieve ring.

29. An impeller assembly according to claim 28, wherein the second portion is generally planar.

30. An impeller assembly according to claim 26, further comprising a stationary blade adjacent to the inner cylindrical surface of the sieve ring and in close proximity to the rotating blade.

31. An impeller assembly according to claim 26, wherein the sieve ring includes sizing holes, and wherein the sizing holes have a diameter of between about 1.3 cm and about 1.9 cm.

32. A waste pulping apparatus comprising:

a tank for containing liquid and solids, the tank having an upper portion with a perimeter;

a frame for supporting the tank;

means for pulping the liquid and solids in the tank;

a shell having a lower portion with a perimeter;

wherein the upper portion of the tank and the lower portion of the shell are nested defining a juncture between the tank and the shell at the perimeters;

a seal placed at the juncture for preventing the liquids from leaving the tank and for minimizing the translation of vibration between the tank and the shell; and

at least one mounting bracket placed between the tank and the frame for mounting the tank onto the frame while minimizing translation of vibration between the tank and the frame.

33. A waste pulping apparatus according to claim 32, wherein the mounting bracket includes a bumper.

34. A waste pulping apparatus according to claim 32, wherein the bumper is made from neoprene rubber.

35. A waste pulping apparatus according to claim 32, wherein the lower portion of the shell is nested within the upper portion of the tank.

36. A feed system for feeding waste into a tank of a waste pulping apparatus comprising:

a tray for feeding liquid and solids into the tank, the tray having an inlet for receiving liquid and a width; and

means for distributing liquid at the inlet of the tray for evenly distributing the liquid across the width of the tray.

37. A feed system for feeding waste into a tank of a waste pulping apparatus comprising:

a tray for feeding liquid and solids into the tank, the tray having an inlet for receiving liquid and a width; and

a dispersion plate at the inlet of the tray.

38. A feed system according to claim 37, further comprising a baffle for directing the liquid down the tray.

39. A feed system according to claim 38, wherein the baffle is placed downstream of the dispersion plate so that the liquid is dispersed across the width by the dispersion plate and directed down the tray by the baffle.

40. A feed system according to claim 37, further comprising a divider plate placed between the inlet and the dispersion plate to aid in dispersing the liquid.

41. A waste pulping apparatus comprising:

a tank having means for pulping solids and liquid into a slurry;

a means for pumping the slurry, the means for pumping being operatively connected to the tank;

an extractor mounted proximate to the tank with an extractor mount, the extractor being for receiving the slurry via the means for pumping and extracting the liquid from the slurry;

a return pump operatively connected to the extractor for returning a portion of the liquid to the tank;

wherein the extractor mount is a quick-release mount to facilitate access to the return pump.

42. A waste pulping apparatus according to claim 41, wherein the quick-release mount comprises one or more hinges.

43. A waste pulping apparatus according to claim 42, wherein the hinges pivot on bolts.

44. A waste pulping apparatus according to claim 41, wherein the means for pumping the slurry is a slurry pump.

45. A waste pulping apparatus according to claim 41, wherein the means for pumping the slurry is a plurality of pumping vanes.